**WHAT IS CLAIMED IS**:

1. A eukaryotic double-stranded RNA (dsRNA) expression vector effective in a eukaryotic cell comprising:

(a) a designated DNA sequence of interest; and

(b) a pair of promoters on opposite ends of the designated DNA, wherein the promoters are oriented towards each other and wherein each is capable of transcribing a strand of DNA into RNA.

2. The dsRNA expression vector of claim 1, wherein the eukaryotic cell is a protist cell.

3. The dsRNA expression vector of claim 2, wherein the protist cell is a protozoan parasite cell.

4. The dsRNA expression vector of claim 2, wherein the protist cell is a *Trypanosoma*, *Leishmania*, *Toxoplasma*, or *Plasmodium* cell.

5. The dsRNA expression vector of claim 1, wherein the designated DNA sequence of interest is a random DNA sequence.

6. The dsRNA expression vector of claim 1, wherein the designated DNA sequence is a known DNA sequence.

7. The dsRNA expression vector of claim 1, wherein the designated DNA sequence is an essential gene from a protist.

8. The dsRNA expression vector of claim 1, wherein the designated DNA sequence is an essential gene from a protozoan parasite.

9. The dsRNA expression vector of claim 8, wherein the designated DNA sequence is an essential gene from *Trypanosoma*, *Leishmania*, *Toxoplasma*, or *Plasmodia*.

10. The dsRNA expression vector of claim 8, wherein the designated DNA sequence is an gene that is normally active during the protozoan's lifecycle when the protozoan is living in a mammalian host.

11. The dsRNA expression vector of claim 8, wherein the designated DNA sequence is an gene that is normally active during the protozoan's lifecycle when the protozoan is living in a mammalian host, but is not active during the protozoan's lifecycle when the protozoan is living in an insect host.

12. The dsRNA expression vector of claim 1, wherein each of the pair of promoters is the same type of promoter.

13. The dsRNA expression vector of claim 1, wherein each of the pair of promoters is a different type of promoter.

14. The dsRNA expression vector of claim 1, wherein at least one of the pair of promoters is a eukaryotic, prokaryotic or viral promoter.

15. The dsRNA expression vector of claim 14, wherein at least one of the pair of promoters is a ribosomal RNA promoter, a *T. brucei* variant surface glycoprotein (VSG) gene promoter, or a procyclic acidic repetitive protein (PARP) gene promoter.

16. The dsRNA expression vector of claim 1, wherein at least one of the pair of promoters is a bacteriophage T7 promoter, a bacteriophage T3 promoter, or an bacteriophage SP6 promoter.

17. The dsRNA expression vector of claim 1, wherein at least one of the pair of promoters is an inducible promoter.

18. The dsRNA expression vector of claim 17, wherein the ribosomal RNA promoter is derived from *Trypanosoma*, *Leishmania*, *Toxoplasma*, or *Plasmodia.*

19. The dsRNA expression vector of claim 1, further comprising (c) a vector backbone.

20. The dsRNA expression vector of claim 19, wherein the backbone is a *Trypanosoma*, a *Leishmania*, a *Toxoplasma*, or a *Plasmodia* expression vector.

21. The dsRNA expression vector of claim 1, wherein the vector is effective in a protist.

22. The dsRNA expression vector of claim 21, wherein the protist is *Trypanosoma*, *Leishmania*, *Toxoplasma*, or *Plasmodia.*

23. The dsRNA expression vector of claim 1, further comprising sequences for integrating the vector into the genome of the eukaryotic cell.

24. The dsRNA expression vector of claim 1, further comprising an expression regulatory region.

25. The dsRNA expression vector of claim 24, wherein the regulatory region comprises a tetracycline operator sequence, a lactose operator sequence, a transcription termination sequence or another transcription regulatory element.

26. A eukaryotic cell containing a eukaryotic double-stranded RNA (dsRNA) expression vector comprising:

(a) a designated DNA sequence of interest; and

(b) a pair of promoters on opposite ends of the designated DNA, wherein the promoters are oriented towards each other and wherein each is capable of transcribing a strand of DNA into RNA.

27. The eukaryotic cell of claim 26, wherein the vector is integrated into the genome of the eukaryotic cell.

28. The eukaryotic cell of claim 26, further comprising an expression regulatory region.

29. The eukaryotic cell of claim 26, wherein at least one of the pair of promoters is an inducible promoter.

30. A vaccine comprising a eukaryotic cell containing, in combination with a physiologically-acceptable, non-toxic vehicle, a eukaryotic double-stranded RNA (dsRNA) expression vector comprising a designated DNA sequence of interest and a pair of promoters on opposite ends of the designated DNA, wherein the promoters are oriented towards each other and wherein each is capable of transcribing a strand of DNA into RNA.

31. The vaccine of claim 30, wherein the vaccine further comprises an immunological adjuvant.

32. The vaccine of claim 30, wherein the eukaryotic cell is a protist cell.

33. The vaccine of claim 32, wherein the protist cell is a protozoan parasite cell.

34. The vaccine of claim 33, wherein the protist cell is a *Trypanosoma*, *Leishmania*, *Toxoplasma*, or *Plasmodium* cell.

35. The vaccine of claim 30, wherein the vector is integrated into the genome of the eukaryotic cell.

36. The vaccine of claim 30, further comprising an expression regulatory region.

37. The vaccine of claim 30, at least one of the pair of promoters is an inducible promoter.

38. A method of protecting a susceptible mammal against colonization or infection of a eukaryotic pathogen comprised of administering to the mammal an effective amount of a vaccine comprising a eukaryotic pathogenic cell, wherein the cell contains, in combination with a physiologically-acceptable, non-toxic vehicle, a eukaryotic double-stranded RNA (dsRNA) expression vector comprising a designated DNA sequence of interest and a pair of promoters on opposite ends of the designated DNA, wherein the promoters are oriented towards each other and wherein each is capable of transcribing a strand of DNA into RNA.

39. The method of claim 38, wherein the vaccine further comprises an immunological adjuvant.

40. The method of claim 38, wherein the vaccine is administered by subcutaneous or intramuscular injection.

41. The method of claim 38, wherein the vaccine is administered by oral ingestion.

42. The method of claim 38, wherein said vaccine is administered intranasally.

43. The method of claim 38, wherein the protist is a protozoan parasite.

44. The method of claim 43, wherein the protist is *Trypanosoma*, *Leishmania*, *Toxoplasma*, or *Plasmodia*.

45. The method of claim 38, wherein the mammal is a human, dog, bovine, porcine, or equine.

46. The method of claim 45, wherein the mammal is a human.

47. The method of claim 38, wherein the vector is integrated into the genome of the eukaryotic cell.

48. The method of claim 38, further comprising an expression regulatory region.

49. The method of claim 38, at least one of the pair of promoters is an inducible promoter.

50. A method of generating double-stranded RNA (dsRNA) comprising culturing a eukaryotic cell that contains a eukaryotic double-stranded RNA (dsRNA) expression vector comprising a designated DNA sequence of interest; and a pair of promoters on opposite ends of the designated DNA, wherein the promoters are oriented towards each other and wherein each is capable of transcribing a strand of DNA into RNA.

51. The method of claim 50, wherein the eukaryotic cell is a protist cell.

52. The method of claim 51, wherein the protist cell is a protozoan parasite cell.

53. The method of claim 52, wherein the protist cell is a *Trypanosoma*, *Leishmania*, *Toxoplasma*, or *Plasmodium* cell.

54. The method of claim 50, further comprising administering a compound so as to regulate transcription of dsRNA by the expression vector.

55. The method of claim 54, wherein the compound stimulates synthesis of dsRNA by the expression vector.

56. The method of claim 54, wherein the compound inhibits synthesis of dsRNA by the expression vector.

57. The method of claim 54, wherein the vector further comprises an expression regulatory region.

58. The method of claim 54, at least one of the pair of promoters is an inducible promoter.

59. A method of screening designated nucleic acids capable of inhibiting expression of an essential eukaryotic gene comprising introducing a eukaryotic double-stranded RNA (dsRNA) expression vector into a eukaryotic cell, wherein the expression vector comprises a designated DNA sequence of interest and a pair of promoters on opposite ends of the designated DNA, wherein the promoters are oriented towards each other and wherein the expression vector produces dsRNA, and measuring the ability of the dsRNA to inhibit expression of the corresponding endogenous DNA.

60. The method of claim 59, wherein the eukaryotic cell is a protist cell.

61. The method of claim 60, wherein the protist cell is a protozoan parasite cell.

62. The method of claim 61, wherein the protist cell is a *Trypanosoma*, *Leishmania*, *Toxoplasma*, or *Plasmodium* cell.

63. The method of claim 59, wherein the expression vector further comprises sequences for integrating the vector into the genome of the eukaryotic cell.

64. The method of claim 59, wherein the expression vector further comprises an expression regulatory region.

65. The method of claim 59, at least one of the pair of promoters is an inducible promoter.

66. The method of claim 59, further comprising administering a compound so as to regulate transcription of dsRNA by the expression vector.

67. The method of claim 66, wherein the compound stimulates synthesis of dsRNA by the expression vector.

68. The method of claim 67, wherein the compound inhibits synthesis of dsRNA by the expression vector.